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Ministry of Economic Development
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PCT/NZ2005/000032

CERTIFICATE

This certificate is issued in support of an application for Patent registration in a country outside New Zealand pursuant to the Patents Act 1953 and the Regulations thereunder.

I hereby certify that annexed is a true copy of the Provisional Specification as filed on 26 February 2004 with an application for Letters Patent number 531396 made by DORANDA LIMITED.

Dated 3 March 2005.

Neville Harris
Commissioner of Patents, Trade Marks and Designs

COMMISSIONER OF PATENTS, TRADEMARKS & DESIGNS
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NEW ZEALAND

PATENTS ACT, 1953

PROVISIONAL SPECIFICATION

A VEHICLE ATTACHMENT FOR FOLDING A GROUND COVER

We, EXTENDAY IP LIMITED, a New Zealand company of Ngarahana Avenue, Albany, New Zealand, do hereby declare this invention to be described in the following statement:

Preferably the attachment further comprises a support arm connectable to the vehicle at one end and the main arm at the other end.

Preferably the support arm is configured to avoid striking the vehicle as the frame is moved from the operating position to the upright, non-operating position.

Preferably the main arm is telescopically adjustable.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention is described by way of example only, with reference to the drawings, in which:

Figure 1 is a perspective view of the attachment in use,

Figure 2 is another perspective view of the attachment in use,

Figure 3 is a plan view of the attachment connected to a vehicle,

Figure 4 is a side view of the attachment connected to a vehicle,

Figure 5 is an front view of the attachment connected to a vehicle,

Figure 6 is a perspective view of the attachment when not connected to a vehicle,

Figure 7 is a perspective view of the attachment connected to a vehicle, and

Figure 8 is a perspective view similar to that of Figure 7 but with the attachment in it's upright, non-operating position.

DETAILED DESCRIPTION OF PREFERRED FORM

Referring to the drawings, Figures 1 and 2 show a preferred form of attachment 1 connected to a vehicle 4 during use for pushing to bunch or fold a ground cover 10 to one side. When a long ground cover sheet has been laid out on the ground between a row of trees for example, the attachment to the vehicle operates to push one side of the ground cover towards the other side of the ground cover, and in essence to bunch or fold the ground cover out of the way to one side of the aisle between the two rows of trees, as a person drives a vehicle such as the quad bike shown, between the rows of trees.

The attachment has a main arm which connects to the vehicle 4 at one end 5. The main arm when in it's operating position extends to one side of the vehicle towards the ground cover 10 as shown.

FIELD OF INVENTION

The invention relates to an attachment for a vehicle for pushing to bunch or fold a ground cover to one side.

BACKGROUND OF INVENTION

One approach to promoting plant growth and development is to place ground covers over the ground adjacent or near to a plant. Use of such covers gives a number of benefits including conserving soil moisture, controlling weed growth and reflecting light back upwards to the plant.

Generally ground covers are put down and removed at various times during the year. The ground covers can be used consecutively on several crops within a growing season and reused over subsequent seasons. Usually moving the ground covers is done by hand and is time consuming and labour intensive, especially in large orchards.

The ground covers are commonly used within orchard blocks which generally comprise rows of crops, plants, trees or vines. For such applications, the ground covers are generally installed between adjacent rows and are available in various lengths and widths to suit.

During the growing season, in some cases the ground cover needs to be temporarily removed to be later replaced, for example to allow soil heat to move from the soil to the air above, or between harvest picks of the crop. Pushing the cover to one side is the best way to do this quickly. This is generally done manually.

SUMMARY OF INVENTION

In broad terms in one aspect the invention comprises an attachment for a vehicle for pushing to bunch or fold a ground cover on the ground to one side, including a main arm connectable to the vehicle at one end of the main arm so that the main arm extends to one side of the vehicle, and a shaped other end which can engage the ground cover on one side of the ground cover, and move that side of the ground cover towards the other side of the ground cover.

Preferably the main arm is pivotally connected to the vehicle to enable the attachment to be moved from an operating position to an upright, non-operating position.

e other end 6 of the main arm is shaped to engage the ground cover on one side 11 of the ground ver and move that side of the ground cover towards the other side 12 of the ground cover.

In use, to push the ground cover to one side, the ground cover is manually bunched or folded to one side at a first end and feed through the shaped end 6 of the main arm of the attachment of the invention, in it's operating position extending to one side of the vehicle. Initially a person is required to stand on the bunched or folded portion or a weight or fastener used to restrict the movement of the bunched or folded portion of the ground cover. The vehicle may then be driven forward along the row as shown in Figure 2, so that the attachment will push the ground cover to one side along it's length.

Figure 3 shows a plan view of the attachment 1 connected to the vehicle. In this preferred embodiment, the main arm 2 is pivotally connected 7 to the front of the vehicle but alternatively the arm could be mounted to the rear or side of the vehicle. Figure 5 shows the main arm 2 extending at a slight angle α from the vehicle towards the ground. The angle of the main arm may vary depending on the distance between the pivotal connection 7 and the ground. The angle of the arm assists to absorb the sideways force as the vehicle moves forward and the material is folded or pushed to one side. It will be appreciated that the main arm need not extend at an angle from the vehicle towards the ground, although that is the preferred embodiment. Rather the main arm may extend horizontally from the vehicle. The pivotal connection 7 allows the attachment to be moved from an operating position as shown in Figures 1-7 to an upright, non operating position as shown in Figure 8. The attachment includes a chain 13 connected between the main arm 2 and the vehicle 4 which tethers the attachment to hold it just above the ground in use. Alternatively however, a wire cable or rope or the like or a fixed arm may be used to tether the attachment. When the arm is moved to it's non-operating position shown in Figure 8 the chain is shortened and reconnected to the vehicle to hold the attachment upright. The upright position is used, for example, at the end of each row of ground cover to allow the vehicle to travel without the attachment unintentionally striking objects.

Figures 3-6 show a preferred form of the shape of the main arm 2. In this preferred embodiment, the other end 6 is shaped with two legs 14 and 15. The first leg 14 is an integral L-shaped extension of the main arm and extends towards the ground cover. The second leg 15 is also an L-shaped extension that extends transverse to the first leg in a vertical direction. Figures 4 and 5 show the second portion 18 of the second leg extending at an angle to the ground.

ures 1-8 show the main arm formed from circular tubing and also show the two legs formed with smooth bends. This is to avoid catching the ground cover as the vehicle and attachment move forward. It will be appreciated that the main arm need not be circular in cross-section, although that is the preferred embodiment. Rather the main arm could be square, elliptical or flat in cross-section.

It will be further appreciated that the main arm need not be shaped with two legs. Other shapes with smooth edges and bends to avoid catching the ground cover may be used. An alternative shape of the main arm is shown in Figures 2 and 7. In this alternative, the second leg includes an extension which extends transverse to the second leg in a horizontal direction.

In use, the first leg 14 passes above the ground and below the ground cover as the vehicle moves forward. The second leg passes 15 above the ground cover.

Each leg also includes extensions 16 and 17, preferably formed from a plastic material, to act as non-destructive guides for guiding the distance between a row of trees and the vehicle.

The preferred form further includes a support arm 3 pivotally connectable 8 and 9 to the vehicle at one end and the main arm at the other end. The support arm holds the main arm in position to prevent it from being deflected rearwardly as the vehicle moves forward. The support arm is also shaped to avoid striking the vehicle as the frame is moved from the operating position to the upright, non-operating position. In this preferred embodiment, the support arm is pivotally connected to the vehicle and to the main arm.

The preferred embodiment requires the support arm to prevent the main arm from being deflected. Rather than being pivotally connected to the vehicle, the main arm may be rigidly connected to the vehicle and the support arm will not be required.

Figure 7 shows that the main arm may be telescopically adjustable. This is to allow for variation in the distance between the vehicle and a row of plants, trees or vines and also variation in the width of ground cover. The length of the main arm also determines the distance that the ground cover will be pushed. As the main am is extended, the ground cover is pushed further away from the vehicle. The main arm includes a flange 20 with a plurality of holes 21 spaced along the length of the flange. This is to allow for the connection 8 between the main arm and support arm to be adjusted as the length of the main arm is adjusted.

The foregoing describes the invention including a preferred thereof. Alterations and modifications as will be obvious to those skilled in the art are intended to be incorporated within the scope hereof.

Extenday IP Limited
by the authorised agents
AJ PARK
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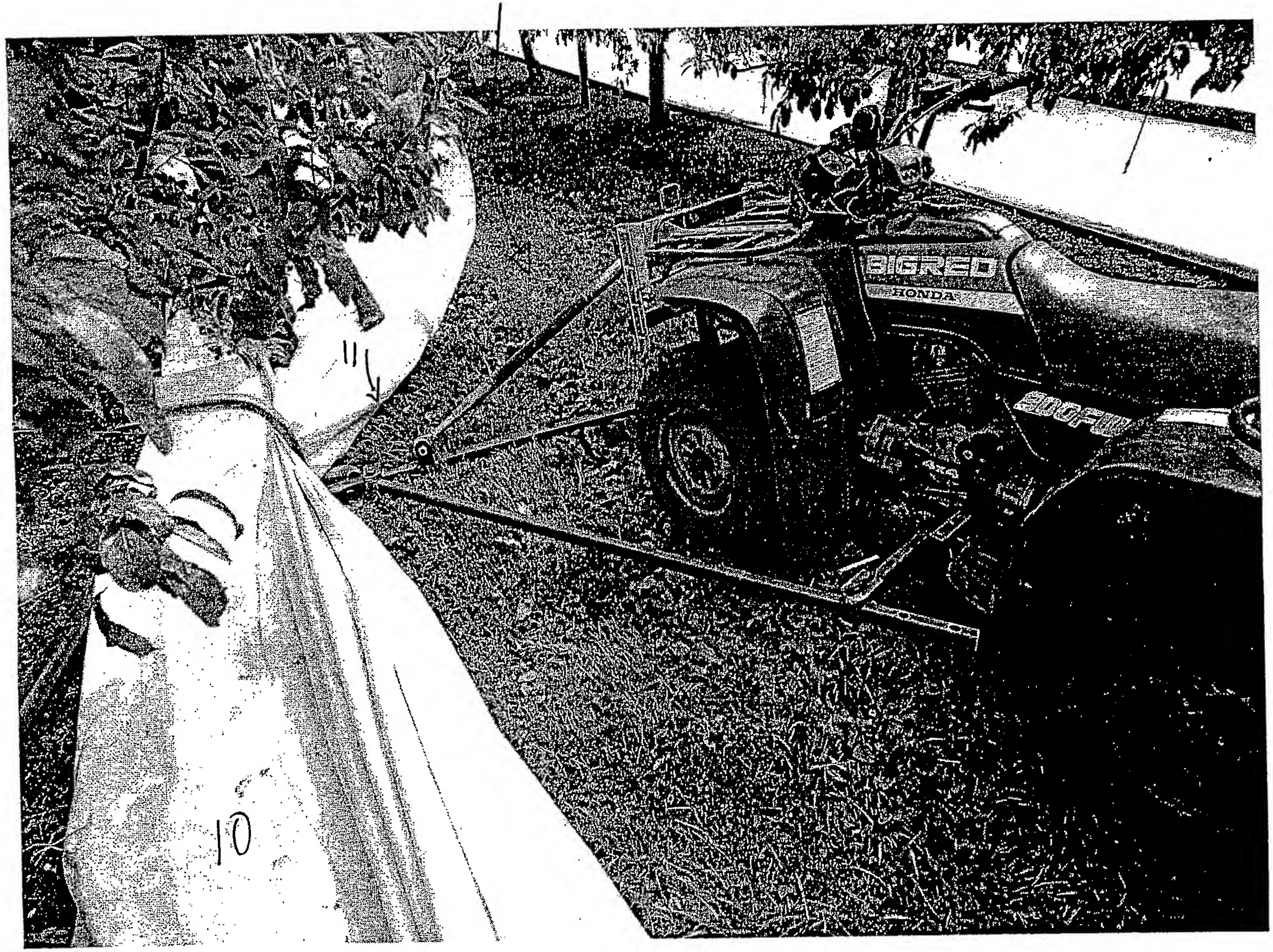

FIGURE 1

FIGURE 2

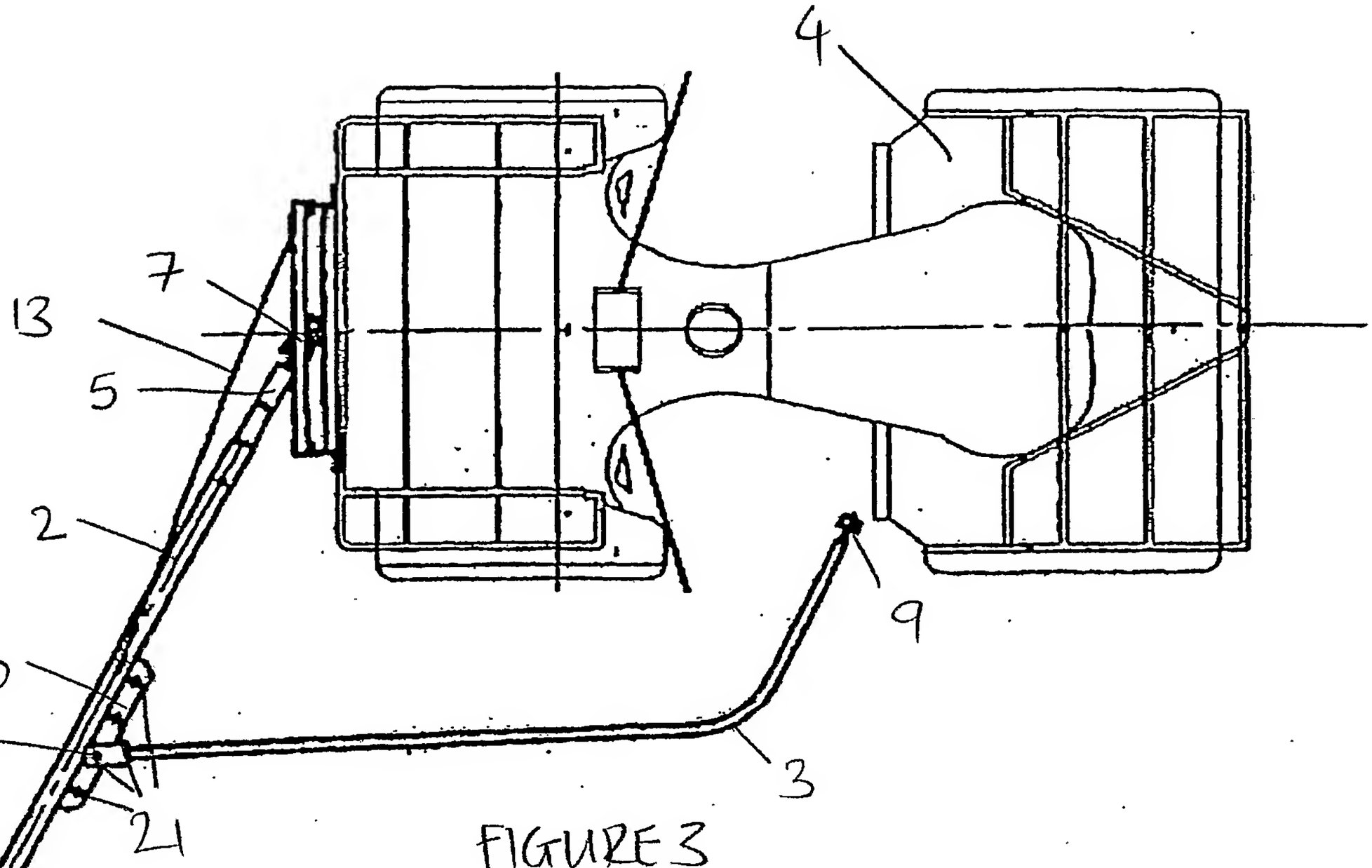

FIGURE 3

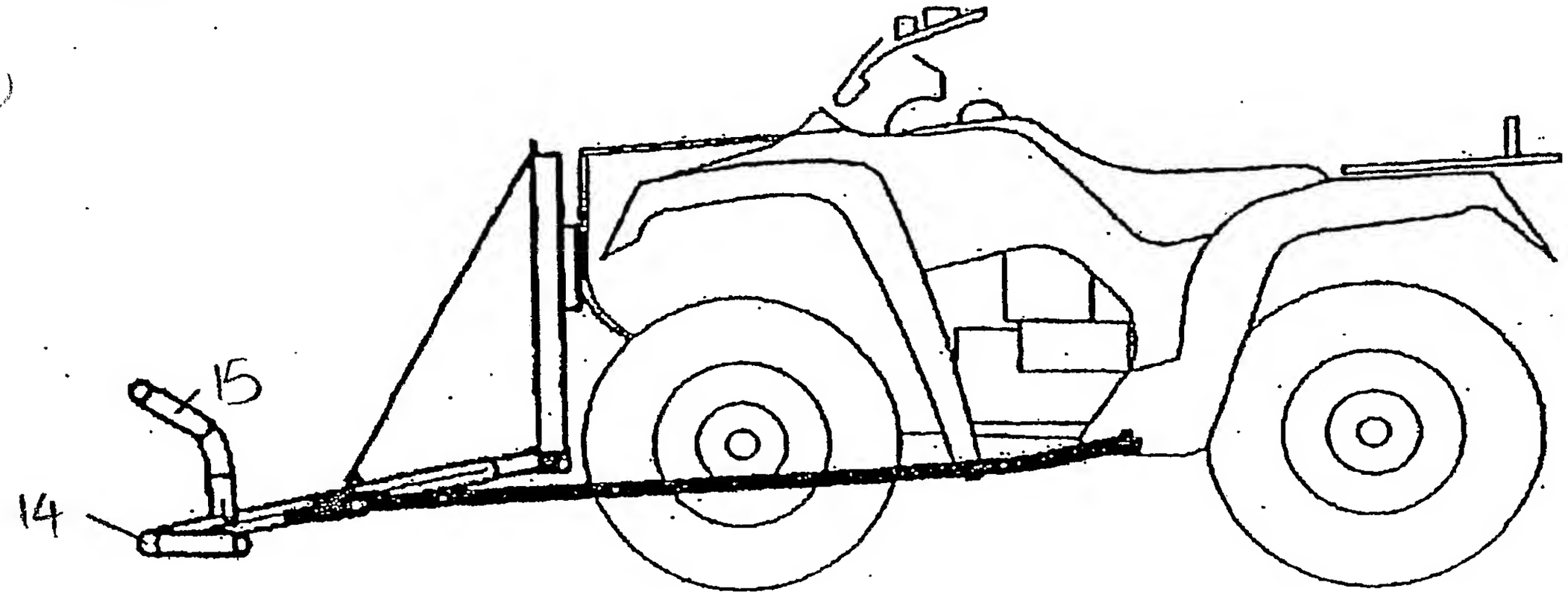

FIGURE 4

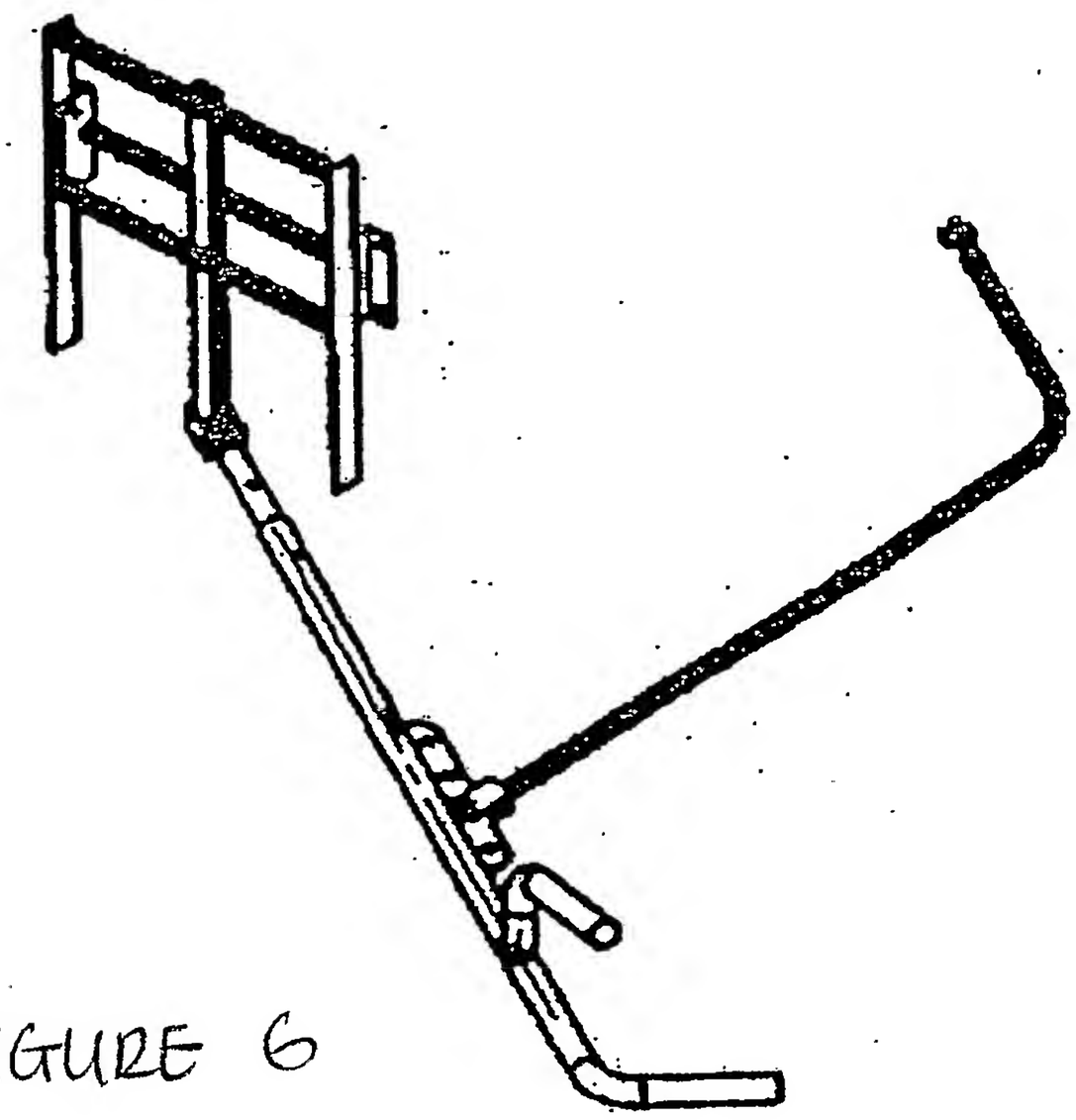

FIGURE 6

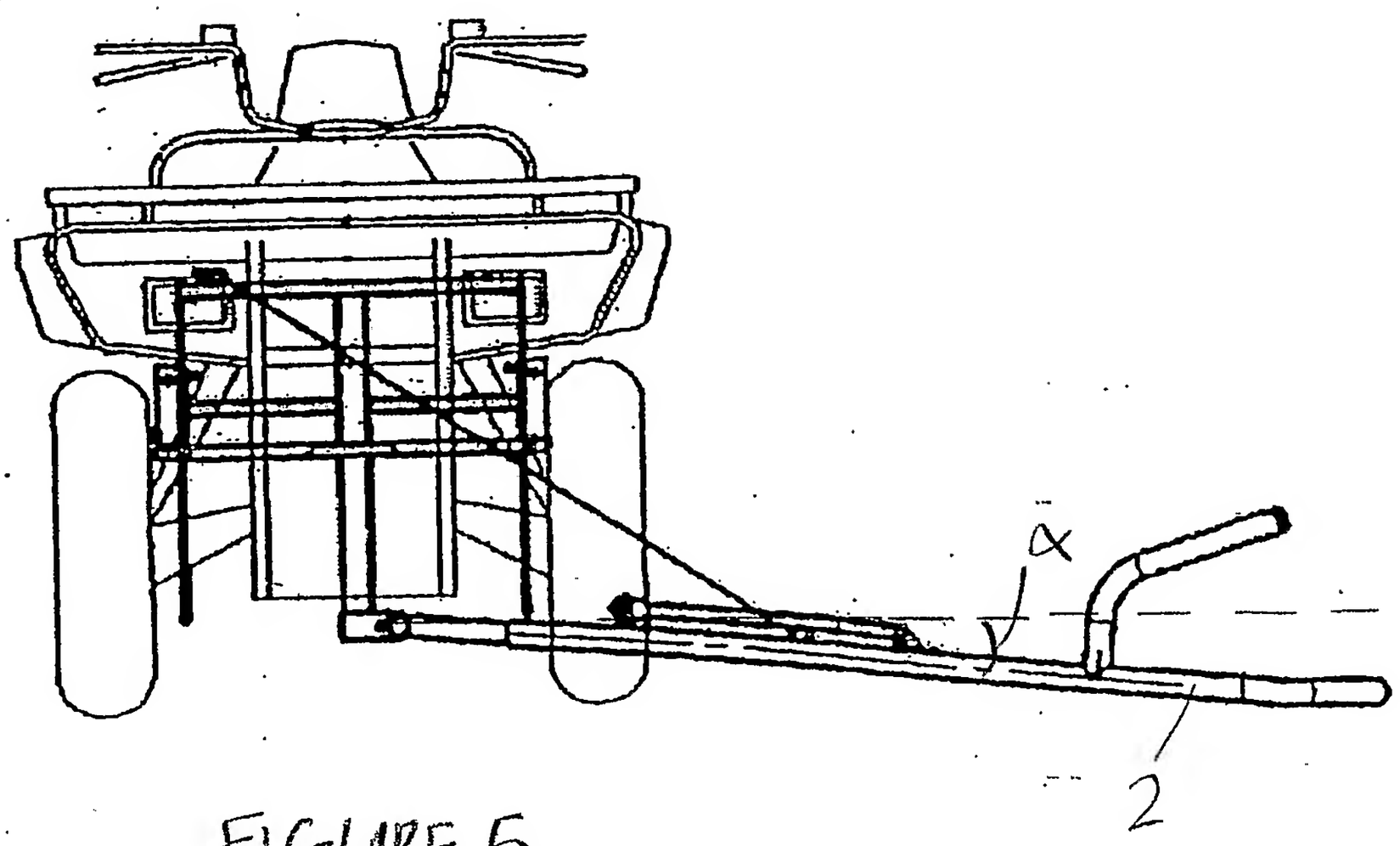

FIGURE 5

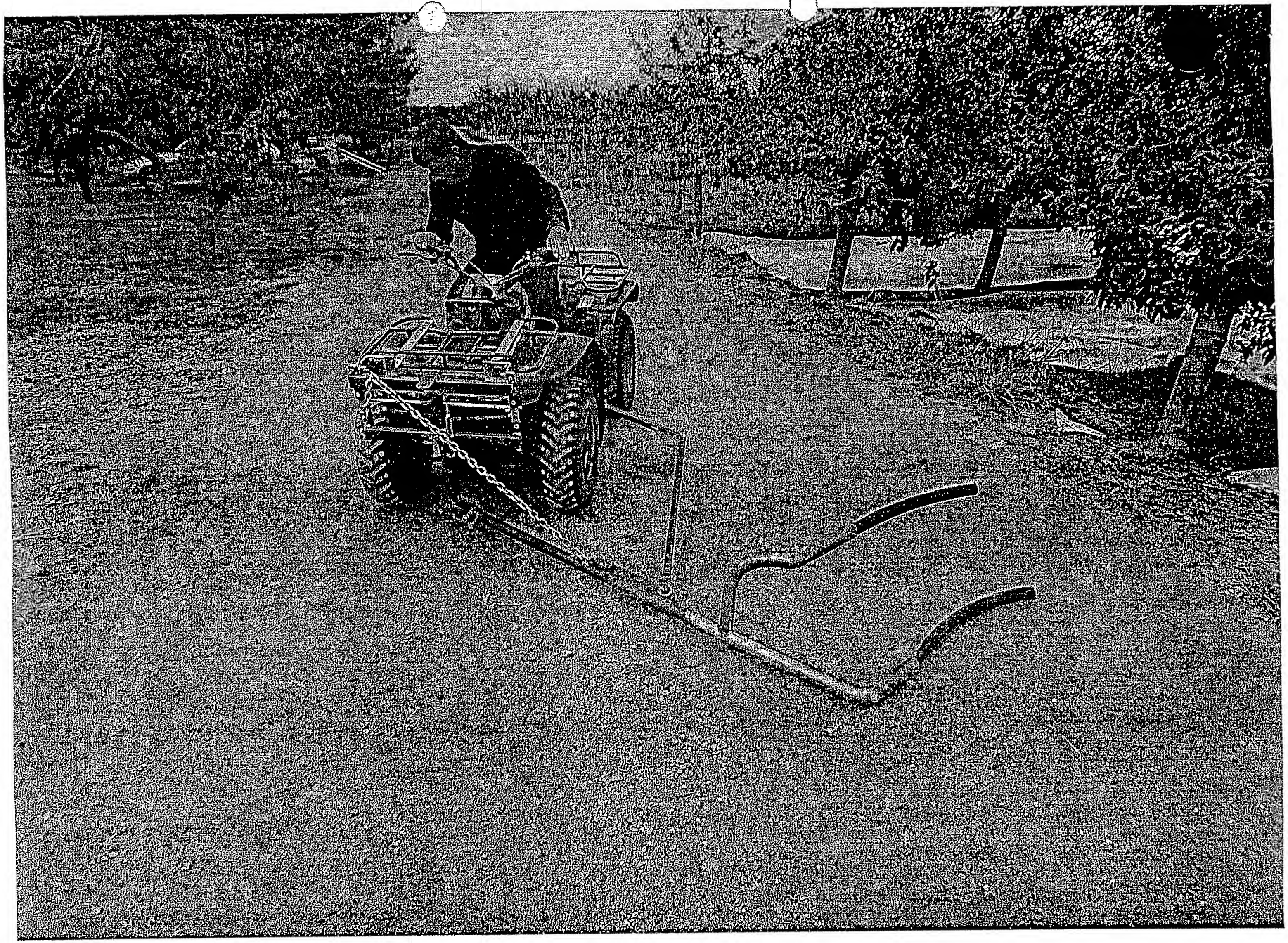

FIGURE 7

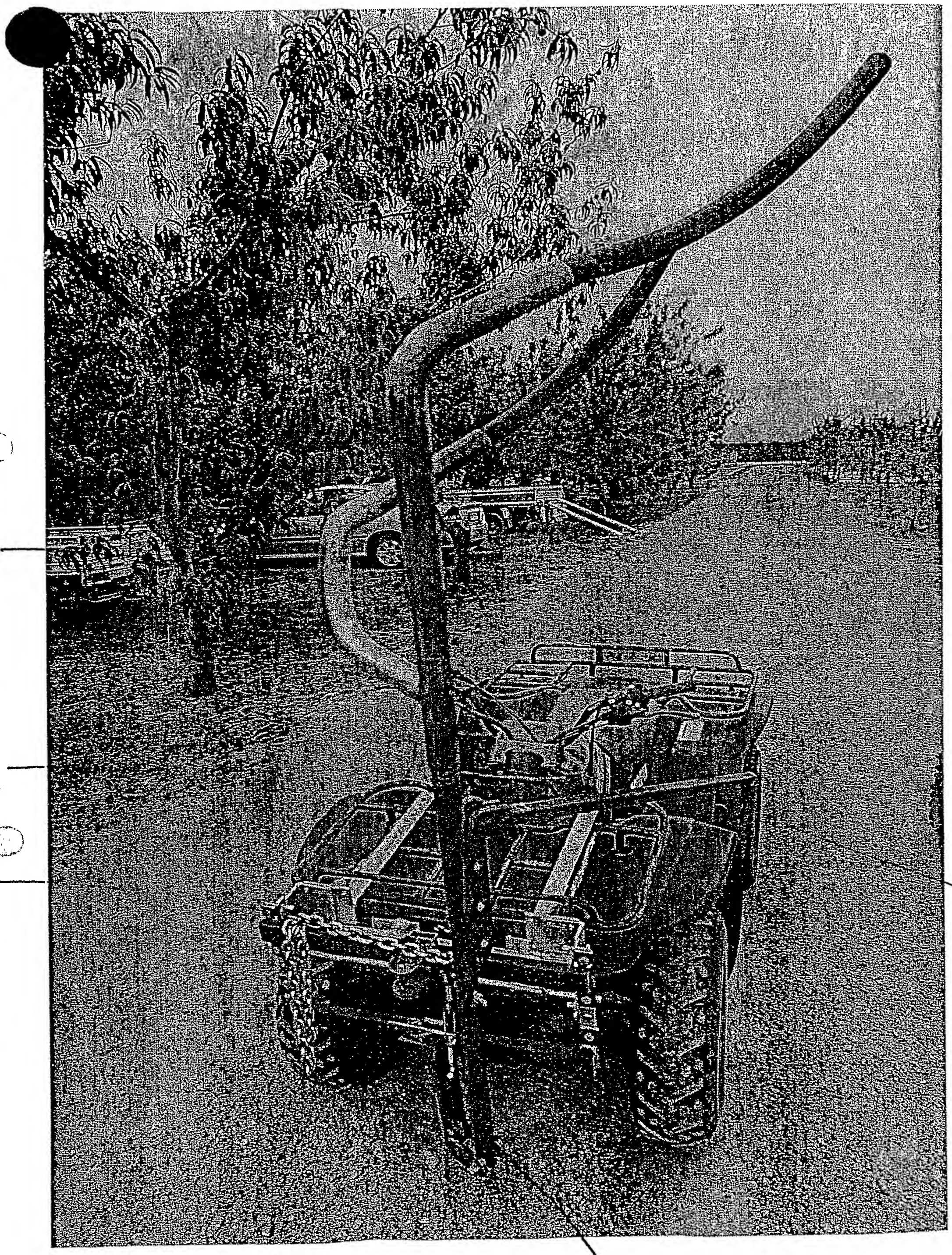

FIGURE 8